

TIME FOR FUN

Suggested Grades

4, 5, 6

SD Mathematics Strand & Standard (*Primary for Task*)

Measurement

5.M.1.1 Students are able to determine elapsed time within an a.m. or p.m. period on the quarter hour.

Task Summary

Students demonstrate their understanding of elapsed time by determining a daily schedule and creating math story problems based on their schedule.

Time and Context of Task

1 – 2 Class Periods, after introduction of time and quarter hour

Materials Needed

Paper, pencils, clocks

Author and Lead Teacher for the Task

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TIME FOR FUN!

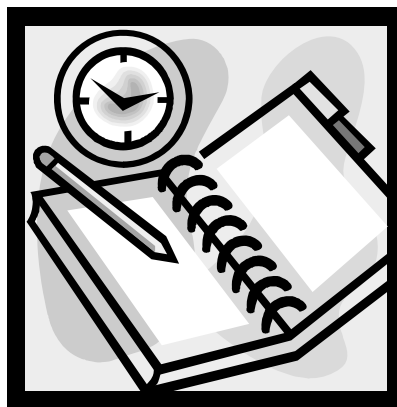
Students will be given a block of time and asked to develop a schedule that will allow them to choose activities that will be fun and educational.

Students will have 6 hours to fit the following in their schedule:

- Math
- Reading
- Science
- Social Studies
- Lunch
- Recess
- Sports, and
- Entertainment

Students will need to calculate time in $\frac{1}{4}$ hour segments, with no class lasting longer than 45 minutes, nor shorter than 15 minutes.

Based on the schedules that they establish, students will write 5 story problems dealing with elapsed time. Students will exchange problems and answer them in groups.



CONTENT STANDARDS

Primary Standard

Strand Name: Measurement

SD Goal: Students will apply systems of measurement and use appropriate measurement tools to describe and analyze the world around them.

Indicator: Apply measurement concepts in practical application.

Standard: 5.M.1.1. Students are able to determine elapsed time within an a.m. or p.m. period on the quarter hour.

Supplemental Standard

Strand Name: Algebra

SD Goal: Students will use the language of Algebra to explore, describe, represent, and analyze number expressions and relations that represent variable quantities.

Indicator: Interpret and develop mathematical models

Standard: 5.A.3.1. Write and solve number sentences that represent two step word problems that use whole numbers.

NCTM Process Standards

Problem-solving

- Build new mathematical knowledge through problem solving
- Apply and adapt a variety of appropriate strategies to solve problems

Communication

- Use the language of mathematics to express mathematical ideas precisely

Representation

- Create and use representations to organize, record, and communicate mathematical ideas

Problem-Solving Strategies

- Estimation and check
- Modeling
- Working backward
- Acting out the problem
- Looking for patterns
- Use of various manipulatives
- Cooperative problem solving

ASSESSMENT TOOLS

Task Rubric

Standard	Advanced	Proficient	Basic	Below Basic
5.M.1.1 Students are able to determine elapsed time within an a.m. or p.m. period on the quarter hour.	Students work to provide all requirements, Utilize entire block of time, Work is completed neatly and accurately Their schedule is clear and easily understood	Students Have the necessary components, use all time available, the schedule is accurate, and is understandable.	The students have some of the elements correct, and have used the time they were given. There schedule is difficult to follow and has errors in calculations	Students do not have the required elements, the schedule does not fit the requirements, and is difficult to follow or missing.
5.A.3.1 Write and solve number sentences that represent two-step word problems that use whole numbers.	Student problems are well written and accurate, and solution of the problems demonstrates more than one way to solve the problems.	Student problems addressed the question, but were lacking in depth and clarity.	Student questions were poorly written and hard to understand.	Student did not follow the format and questions were stated incorrectly or missing.

Additional rubrics can be retrieved from K-12 Exemplars.com
<http://www.exemplars.com/resources/rubrics/assessment.html>

**Fifth Grade Measurement
Performance Descriptors**

Advanced	Fifth grade students performing at the advanced level: <ul style="list-style-type: none"> • solve two-step problems involving measurement of length, time, temperature, weight, money, and capacity.
Proficient	Fifth grade students performing at the proficient level: <ul style="list-style-type: none"> • use appropriate tools to solve problems involving measurement of length, time, temperature, and weight; • convert U.S. Customary measurement units. • solve problems involving money including making change.
Basic	Fifth grade students performing at the basic level: <ul style="list-style-type: none"> • measure length, time, temperature, weight, and capacity. • solve one-step money problems.

**Fifth Grade Measurement
ELL Performance Descriptors**

Proficient	Fifth grade ELL students performing at the proficient level: <ul style="list-style-type: none"> • use appropriate tools to apply systems of measurement; • read, write, and speak the language of mathematics; • solve problems involving money including making change.
Intermediate	Fifth grade ELL students performing at the intermediate level: <ul style="list-style-type: none"> • use the basic measurement tools in the U.S. Customary system; • use appropriate measurement units to solve problems; • use measurement terms to explain how to solve problems; • give simple oral or written responses to directed questions on topics presented in class; • solve one-step money problems.
Basic	Fifth grade ELL students performing at the basic level: <ul style="list-style-type: none"> • recognize measurement tools used in various situations; • recognize and use basic measurement terms; • respond to yes or no questions and to problems presented pictorially or numerically in class.
Emergent	Fifth grade ELL students performing at the emergent level: <ul style="list-style-type: none"> • copy and write measurement symbols; • imitate pronunciation of numbers and measurement terms; • use non-verbal communication to express measurement ideas.
Pre-emergent	Fifth grade ELL students performing at the pre-emergent level: <ul style="list-style-type: none"> • observe and model appropriate cultural and learning behaviors from peers and adults; • listen to and observe comprehensible instruction and communicate understanding non-verbally.

TIME FOR FUN

Student Work Samples



As you examine the samples, consider the following questions:

- In light of the standard/s addressed and the assessment tools provided, what evidence does the work provide that students are achieving proficiency in the knowledge and skills addressed by the standard/s for the task?
- Is the task/activity well designed to help students acquire knowledge and demonstrate proficiency? Is the task/activity clearly aligned with the standards? In what ways would you adapt the task/activity to better meet the needs of your students?

Student Work Sample #1
Page 1

Sample 1

4:00

4:00

15 105 150 180

45 + 45 + 30 + 30 210

30 90 150 180 210 + 45

8:15 3:30 255

Monday	Tuesday	Wednesday	Thursday	Friday	
15 min recess	15 min recess	15 min recess	15 min recess	15 min recess	30
45 min Reading	45 min Science	45 min Reading	45 min Science	45 min	15
30 min Science	30 min Reading	30 min Science	30 min Reading	30 min Science	60
15 min recess	45 min S.S.	15 min recess	45 min S.S.	15 min recess	400
45 min Social Studies	15 min recess	45 min Social Studies	15 min recess	45 min S.S.	
30 min Lunch	30 min Lunch	30 min Lunch	30 min Lunch	30 min Lunch	
recess	recess	recess	recess	recess	
30 min	30 min	30 min	30 min	30 min	
45 min Math	45 min Chorus	45 min Math	45 min Chorus	45 min Math	
45 min Chorus	45 min Math	45 min Computer	45 min Math	45 min Art	
15 min recess	15 min recess	15 min recess	15 min recess	15 min recess	
45 min SH	45 min SH	45 min SH	45 min SH	45 min SH	

8:15
- 1:15
7

1. It's 12:32 right now how long ago did we start Social Studies on Wednesday.
2. How much time passes before we go to chorus on Monday?
3. It's lunch right now, how much more time till recess on Wednesday?
4. It's noon how much more time till basketball practice on Friday?
5. It's reading how much time till recess on Monday?

Advanced: The students worked to get the required classes and break in, and did work more “Entertainment” time into the schedule. Their questions were well thought out and appropriate. The fact that they varied the classes from day to day showed they liked a variety of activities in a different order.

Student Work Sample #2

Page 1

Sample =

Reading	8:30 - 9:00 AM
Science	9:00 - 9:30 AM
S.S.	9:30 - 10:15 AM
Math	10:15 - 11:00 AM
Lunch	11:00 - 11:15 AM
recess	11:15 - 12:00 pm
(male) (MTV)	entertainment 12:00 - 12:30 pm
sports	12:30 - 1:00 pm
Study Hall	1:00 - 1:30 pm
Guidance	1:30 - 2:00 pm
SH	2:00 - 2:30 pm

① If we end SS @ 10:15, how much time has it been since we started Reading?

② We wanted to end Entertainment 15 min earlier on Monday. How much time has it been since we ended recess?

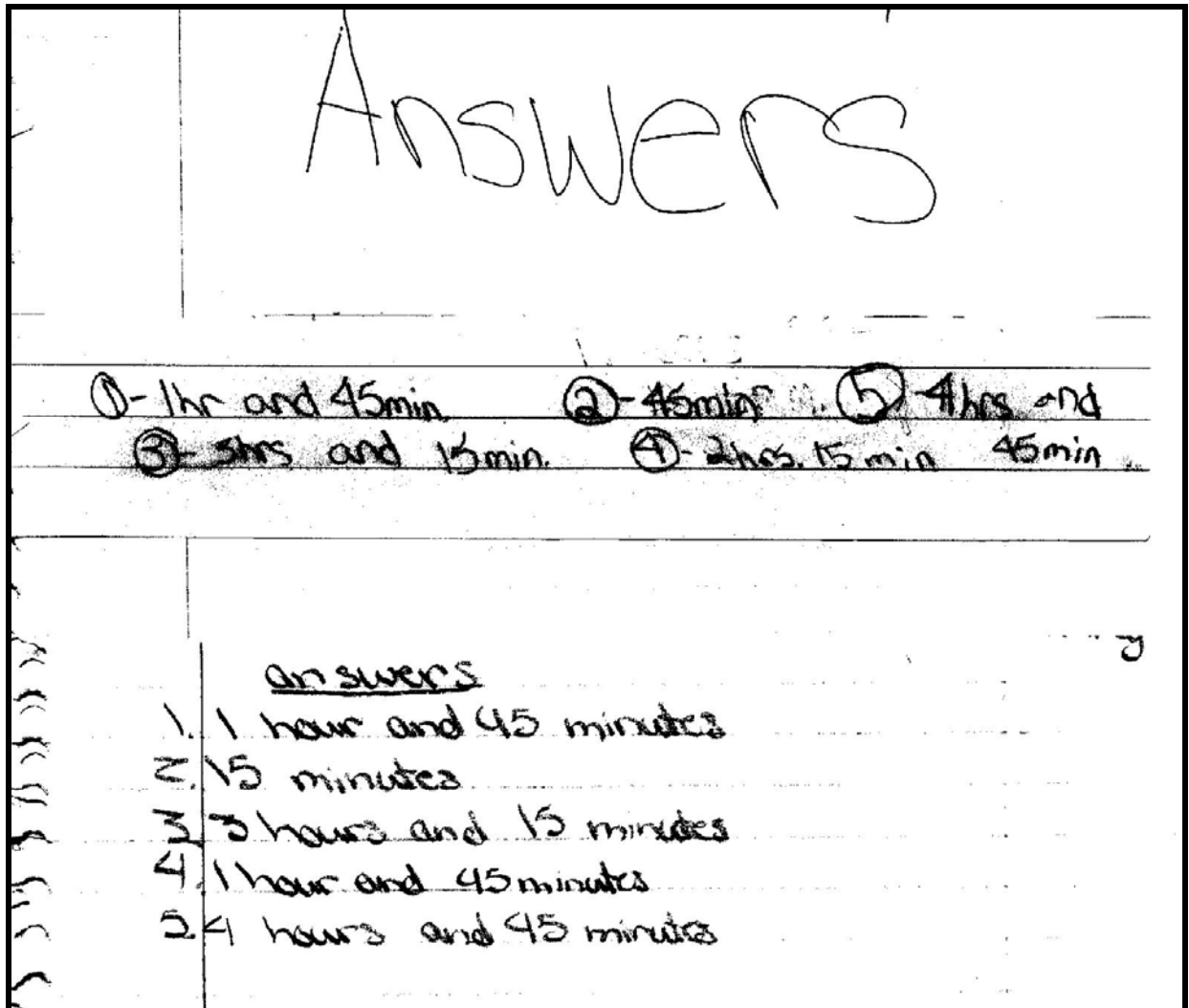
③ How much time is it from 11:15 to 2:30?

④ If we start recess at 11:15, how much time has it been since Science?

⑤ If we end Guidance at 2:00 and if we started S.S. 15 min earlier, how much time is between.

Sample #2 – Page 2

Time ↓	Monday	Tuesday	Wednesday	Thursday	Friday	Days ← recess →
8:30-9:00 ^{am}	Reading	Reading	Reading	Reading	Reading	147
9:00-9:30 ^{am}	Science	Science	Science	Science	Science	147
9:30-10:15 ^{am}	S.S.	S.S.	S.S.	S.S.	S.S.	131
10:15-11:00 ^{am}	Math	Math	Math	Math	Math	131
11:00-11:15 ^{am}	Lunch	Lunch	Lunch	Lunch	Lunch	cafeteria
11:15-12:00 ^{pm}	Recess	Recess	Recess	Recess	Recess	outside
12:-12:30 ^{pm}	Entertainment	entertainment	entertainment	entertainment	entertainment	129
12:30-1:00 ^{pm}	Sports	sports	sports	sports	sports	Gym or outside
1:00-1:30 ^{pm}	SH	SH	SH	SH	SH	131
1:30-2:00 ^{pm}	Guidance	Guidance	Guidance	Guidance	Guidance	cafeteria
2:00-2:30	SH	SH	SH	SH	SH	147



Looking at Student Work – Instructor notes and rating for work sample #2:

Proficient: The students worked a schedule out that allowed for all the required parts. They added the location of the activities, but missed an important part, that they were to find more fun time in the day.

Weekly all the days are the same!

Reading	9:00 - 9:30
- Science	9:30 - 10:15
- Math	10:15 - 10:45
Movie	10:45 - 11:30
Lunch	11:30 - 12:00
- Recess	12:00 - 12:30
DE	12:30 - 1:00
SS	1:00 - 1:45
- Recess	1:45 - 2:00
Spelling	2:00 - 2:30
- Sports	2:30 - 3:00

	questions
1.	How much time passes from the beginning of science to the end of p.e.
2.	How much time has passed from the end of math till end of sports?
3.	How long has it been from beginning of math to 11:30?
4.	How much time passes from the beginning of the first recess to the end of the second recess
5.	How much time pass from the beginning of the movie to the end of p.e.

	Answers
1.	9:30 - 10:00
	3 hours and 30 minutes
2.	10:45 - 3:00
	4 hours and 45 minutes
3.	10:15 - 11:30
	1 hour and 15 minutes
4.	12:00 - 2:00
	2 hours
5.	10:45 - 1:00
	2 hours and 45 minutes

Basic: The students lacked the effort to put together a complete schedule, but it does mirror the schedule they currently follow. They did not have good questions that were well thought out.

INSTRUCTIONAL NOTES

“Time for Fun” – I did this exercise/task with 6th grade. This class really dug into it and had a lot of fun. They had a little trouble with getting away from the typical schedule. I thought they would really have some original schedules, but they didn’t. It took 2 total class periods of 50 minutes, plus about 15 minutes of another class period for the groups to trade and answer each other’s questions.

Here are some of the questions and comments they had while they worked:

- Do we include passing time?
- How many days? Do we plan for a school week or just one day?
- What does entertainment mean?
- What about passing time between classes – is it included in 6 hours?
- What about sports – is that entertainment?
- Can you include other things besides required subjects?
- Would the extras be included in 6 hours – such as Language Arts?
- Can we split up the subjects – for example, have 2 times for math, but not go over 45 minutes?
- They observed that if you had all 6 classes equal 45 minutes you would have our 6 hours.
- Can you have different subjects on different days? Not every day.
- When does school start and end:? Can we make that up?
- One group asked if they could take it home and type it.
- One group asked if they could use one of my blank schedule forms.
- They had trouble sometimes coming up with an actual elapsed time problem, even though they knew what it was – had trouble with the wording of the question.
- \one group had a lot of trouble with the actual setup and put class period lengths instead of clock time. They knew they did it wrong, but did not want to start over. The group who got their questions had a little trouble with them, as there were no starting and stopping times.

Author Comments

Students were very diligent in their efforts, and were experiencing some difficulty in straying from the order and rigor they have known in our schedules.

Task Extensions

Students were talking about how they could use their “New” schedules to communicate a “better” schedule within their current class schedule.

Common Strategies

Prior knowledge of how their current schedules work.

Common Misunderstandings

Students had a hard time understanding the concept of time limits, and the relationship to the task at hand, and the scheduling of activities.

Resources

SD Mathematics Content Standards

<http://www.doe.sd.gov/contentstandards/math/index.asp>

SD Assessment and Testing

<http://www.doe.sd.gov/octa/assessment/index.asp>

The National Assessment of Educational Progress (NAEP)

<http://www.doe.sd.gov/octa/assessment/naep/index.asp>

National Council of Teachers of Mathematics

<http://nctm.org/>

Looking at Student Work

<http://www.lasw.org/index.html>